A Comparative Health Survey of the Inhabitants of Roma Settlements in Hungary

Zsigmond Kósa, MD, PhD, György Széles, MD, PhD, László Kardos, MD, PhD, Karolina Kósa, MD, PhD, Renáta Németh, MSc, Sándor Országh, MSc, Gabriella Fésüs, MSc, Martin McKee, MD, Róza Ádány, MD, PhD, and Zoltán Vokó, MD, PhD

Objectives. We compared the health of people living in Roma settlements with that of the general population in Hungary.

Methods. We performed comparative health interview surveys in 2003 to 2004 in representative samples of the Hungarian population and inhabitants of Roma settlements.

Results. In persons older than 44 years, 10% more of those living in Roma settlements reported their health as bad or very bad than did those in the lowest income quartile of the general population. Of those who used any health services, 35% of the Roma inhabitants and 4.4% of the general population experienced some discrimination. In Roma settlements, the proportion of persons who thought that they could do much for their own health was 13% to 15% lower, and heavy smoking and unhealthy diet were 1.5 to 3 times more prevalent, than in the lowest income quartile of the general population.

Conclusions. People living in Roma settlements experience severe social exclusion, which profoundly affects their health. Besides tackling the socioeconomic roots of the poor health of Roma people, specific public health interventions, including health education and health promotion programs, are needed. (*Am J Public Health.* 2007; 97:853–859. doi:10.2105/AJPH.2005.072173)

The processes leading to enlargement of the European Union in May 2004 focused unprecedented attention on the plight of the Roma, or Gypsy, people in Central and Eastern Europe.[1,2] The Roma, a people who moved from northern India into Europe between the 9th and 14th centuries, number between 5 and 10 million people and are the European Union's largest minority group. Within the European Union, most of the Roma population lives in the new member states—in particular, Romania, Bulgaria, Hungary, and Slovakia.[3] The number of Roma living in the United States was estimated to be between 200 000 and 500 000 in the early 1970s.[4] The first group of Roma to migrate to the United States was transported as slaves.[5]

Researchers have documented in detail the poor conditions in which the Roma people live, the discrimination they face, and the problems they confront when trying to access services.[6] Numerous studies have shown that the Roma people have high levels of many diseases,[7,8] but remarkably little systematic research has been done on how the health of this population compares with the majority populations in the countries in which they live.[9]

Researchers also have considerable difficulty in defining the Roma population. It is characterized by great diversity in language and dialect, culture, religion, and social class.[10] Some Roma people have assimilated and intermarried with the majority population, although many still live apart from the majority population.

The cultural inaccessibility of the Roma population poses difficulties in research on their health. The Roma's strong sense of "otherness" plays an important role in the inaccessibility.[11–13] The widespread fear among ethnic minorities in Europe that—regardless of their legal status—ethnic statistics will be misused adds to the difficulties.[14] For this reason, the gathering of ethnic identity during research is strictly regulated in most European countries. Fear of legal challenges and a misunderstanding by researchers of data protection laws in many countries have resulted in a dearth of reliable statistical data on the number of Roma people in Europe.

Another problem is that although many studies have documented poor health among the Roma people, few studies have compared their health with that of the majority population. This lack of comparison is an important omission given the generally poor health in Central and Eastern Europe, characterized by high premature mortality (generally defined as death before age 65 years) mainly as a result of cardiovascular diseases, cancer, chronic liver diseases, and accidents. Although life expectancy has been increasing for a decade in Hungary, at the time of the study, of the current 25 European Union member states, only Estonia, Latvia, and Lithuania had lower figures than Hungary, in which male life expectancy was 68.4 years in 2003. Hungarian women had the second lowest figure of 76.8 years in 2003.

We have performed a study that was designed to overcome some of the difficulties that have faced earlier researchers. First, we used an innovative approach to identify the section of the Roma population that is most vulnerable. Second, we incorporated an explicit comparison with the majority population. Third, the design, conduct, and interpretation of the study were fully participative, involving representatives of the Roma population at all stages.

METHODS

The data used in this study were obtained from 2 surveys that were designed to be comparable and were conducted only 6 months apart. The first survey—the National Health Interview Survey—focused on the general Hungarian adult population. The second was a specific survey of the adult population living in Roma settlements in 3 counties of northeastern Hungary, the part of the country with the highest Roma population.

National Health Interview Survey 2003

The National Health Interview Survey, 2003, was designed to capture detailed information on the self-reported health status of the noninstitutionalized Hungarian adult

population, as well as the main behavioral and socioeconomic determinants of health.[15]

The study population was randomly selected via 2-stage sampling from the Central Data Processing, Registration and Election Office's registry. In the first stage, communities (cities, towns, and villages) were stratified by county and by community size. Within counties, communities were chosen with a sampling probability proportional to size. Individuals were then selected at random from the selected communities. To maximize the cost-effectiveness of the fieldwork, at least 10 individuals were chosen from each community selected.

In the fall of 2003, fieldworkers with experience in interview techniques who had received additional training in health survey techniques performed the interviews.

Roma Health Survey

The poor living conditions in which some Roma people live, frequently on the outskirts of towns and villages and in substandard accommodations, allow relatively straightforward identification of locations in which Roma people are concentrated. This study took advantage of this opportunity. Between 2001 and 2003, a detailed environmental survey was undertaken in 3 counties in which the Roma population is greatest; the researchers identified all such settlements (in which the population was almost exclusively Roma) and recorded the number of people living in them.[16] Although the size of the overall Roma population is uncertain, it is estimated that about 6% to 10% of the Roma people live in such settlements.[16,17]

In the environmental survey, settlements with at least 4 households were mapped, and the resulting plot was used as the basis for the health survey reported here. Collectively, approximately 62 000 persons lived in the Roma settlements in these counties (of a total population of the counties of 1 877 243). The survey sought to capture representative data on 1000 persons living in these settlements who were 18 years or older.

We used a 2-stage sampling process: towns and villages in the 3 counties with identified settlements were selected randomly, and then households were selected with the random walk method, based on a map of the settlement.[18] All adults in the households selected were interviewed by the interviewers, who were all Roma people who had undergone training in survey methods. Interviews were performed from May to August 2004.

Questionnaire

The questionnaires used in the 2 surveys were almost identical, allowing direct comparison of the results.[19]

The analysis presented here used data on general self-reported health status, including functionality and self-perceived health, use of health care services, health behavior (beliefs, perceptions, habits, actions, and so on, related to health), and socioeconomic status.

We used internationally recommended survey tools when possible. Most questions were asked by the interviewer; some sensitive subjects such as alcohol consumption, social support, and discrimination were included in a self-administered section of the questionnaire.

Self-reported health was assessed with a standard 5-item question recommended by the World Health Organization (WHO) to measure perceived health.[20] For this analysis, we combined the categories "good" and "very good" as well as "bad" and "very bad." Functional limitation was assessed with the following question: "Do you have any complaints, injuries, or diseases that limit your everyday activities, such as working, shopping, managing your life, playing sports, or keeping contact with other people?" Height and weight were self-reported, and body mass index (BMI) was calculated as body weight (kg) divided by height in meters squared (m^2). BMI was categorized as abnormally thin (BMI$<$18.5 kg/m^2), normal (BMI$=$18.5–24.99 kg/m^2), overweight (BMI$=$25–29.99 kg/m^2), or obese (BMI$\geq$30 kg/m^2), in accordance with the WHO guidelines.

Data on cigarette smoking, alcohol consumption, and social support were derived from answers given to multiple-question modules. For alcohol, questions focused on frequency and quantity. Consumption was categorized as heavy drinking (more than 7 standard drinks—a standard drink was defined as the equivalent of 12 g of pure ethanol—per week or more than 3 standard drinks on any day for women; more than 14 standard drinks per week or more than 5 standard drinks on any day for men), moderate drinking (weekly consumption but less than heavy drinking), occasional drinking (consumption less often than weekly), and abstinence.[21,22] The instrument recommended by the European Health Interview Surveys (EUROHIS) project of WHO for assessing smoking in population surveys was used.[20] Social support was measured using an instrument developed in the Health and Lifestyles Survey of England. It consists of 7 questions about physical and emotional aspects of social support. These questions combine into a single scale categorizing informants as having "severe lack," "some lack," or "no lack" of social support. In this analysis, we combined the categories of "some lack" and "severe lack."[23]

Data Analysis

We estimated the prevalence of the key variables in the 2 target populations. We applied weights to correct for the unequal probability of selection and for nonresponse, as well as to perform poststratification by age, gender, and community size in the national survey. We used the survey analysis module in the statistical program Stata 6.0 (Stata Corp, College Station, Tex) to calculate the 95% confidence intervals (CIs) of the prevalence estimates after taking into account the sampling design.

Mean household equivalent monthly income was calculated as the mean total household income per month divided by the square root of the number of persons in the household. Households were divided into quartiles based on their mean total household income per month (ranges in Euros from lowest to highest: $<$202, 203–283, 284–377, $>$377). We also estimated the prevalence of key variables for the lowest equivalent monthly income quartile in the general population.

All analyses were stratified by age and gender. The age categories were defined as 18 to 29, 30 to 44, and 45 to 64 years.

RESULTS

Of the planned 7000 interviews, 5072 were completed in the National Health Interview Survey. Of the participants selected, 15% could not be located during the period of fieldwork, 8% refused to participate, and

TABLE 1—Major Characteristics of the Socioeconomic Status Among Persons Living in Roma Settlements and in the General Population in Hungary: National Health Interview Survey 2003 and Roma Health Survey 2004

Characteristics	People Living in Roma Settlements			People in Lowest Income Quartile			General Population		
	18–29 y	30–44 y	45–64 y	18–29 y	30–44 y	45–64 y	18–29 y	30–44 y	45–64 y
Only primary education (8 years), %	73 (68, 77)	80 (75, 84)	87 (82, 91)	43 (36, 50)	44 (38, 50)	50 (45, 56)	16 (14, 19)	17 (15, 20)	29 (26, 32)
Actively employed, %	17 (14, 21)	22 (18, 27)	11 (7, 16)	18 (12, 27)	40 (32, 49)	24 (19, 30)	62 (59, 65)	79 (76, 81)	53 (51, 56)
Mean household equivalent income per month, Euro	170 (160, 180)	161 (153, 169)	159 (150, 168)	143 (138, 148)	146 (142, 151)	150 (146, 154)	332 (316, 348)	307 (293, 321)	300 (290, 309)
Perceived financial status									
Very bad, %	20 (16, 24)	18 (14, 23)	26 (20, 32)	9 (5, 14)	14 (10, 18)	16 (13, 20)	2 (1.5, 3)	4 (3, 5)	5 (4, 7)
Bad, %	40 (35, 45)	43 (38, 49)	39 (33, 46)	31 (25, 38)	34 (29, 40)	36 (31, 40)	13 (11, 16)	16 (14, 18)	20 (18, 22)
Living in a 1-room apartment, %	11 (8, 14)	12 (9, 16)	15 (10, 20)	17 (13, 23)	15 (11, 21)	15 (12, 19)	9 (7, 11)	8 (6, 10)	6 (5, 8)
Lack of social support, %	24 (20, 28)	27 (22, 32)	24 (19, 30)	16 (11, 22)	20 (15, 25)	23 (19, 28)	11 (9, 13)	15 (13,18)	14 (12, 15)

Note. Numbers are estimated proportions (%) or means in the populations (95% confidence intervals).

4% were unable to participate for other reasons. Data from the 4121 persons younger than 65 years were included in the analysis.

In the Roma Health Survey, of the 1000 attempted interviews, 969 interviews were completed successfully, 12 persons refused to participate, and 19 interviews were incomplete (96.9% response rate). Data from the 936 persons younger than 65 years were included in the analysis.

As expected, the participants in the Roma survey had less education, were less likely to be employed, had much lower income, worse living conditions, and weaker social support compared with the general population (Table 1). The mean household equivalent monthly income of Roma people was somewhat higher than that of people in the lowest income quartile of the general population.

The self-reported health status of the people living in Roma settlements was much worse than the self-reported health status of the general population. Of those living in Roma settlements, substantially fewer people reported their health as good or very good, and many more reported their health as bad or very bad—at age 30 to 44 years, 18% (95% CI=14%, 23%), and at age 45 to 64 years, 50% (95% CI=44%, 57%), compared with 8% (95% CI=7%, 10%) and 25% (95% CI=23%, 27%), respectively, in the general population. In the lowest income quartile of the general population, these estimates were 20% (95% CI=15%, 25%) and 40% (95% CI=35%, 45%), respectively.

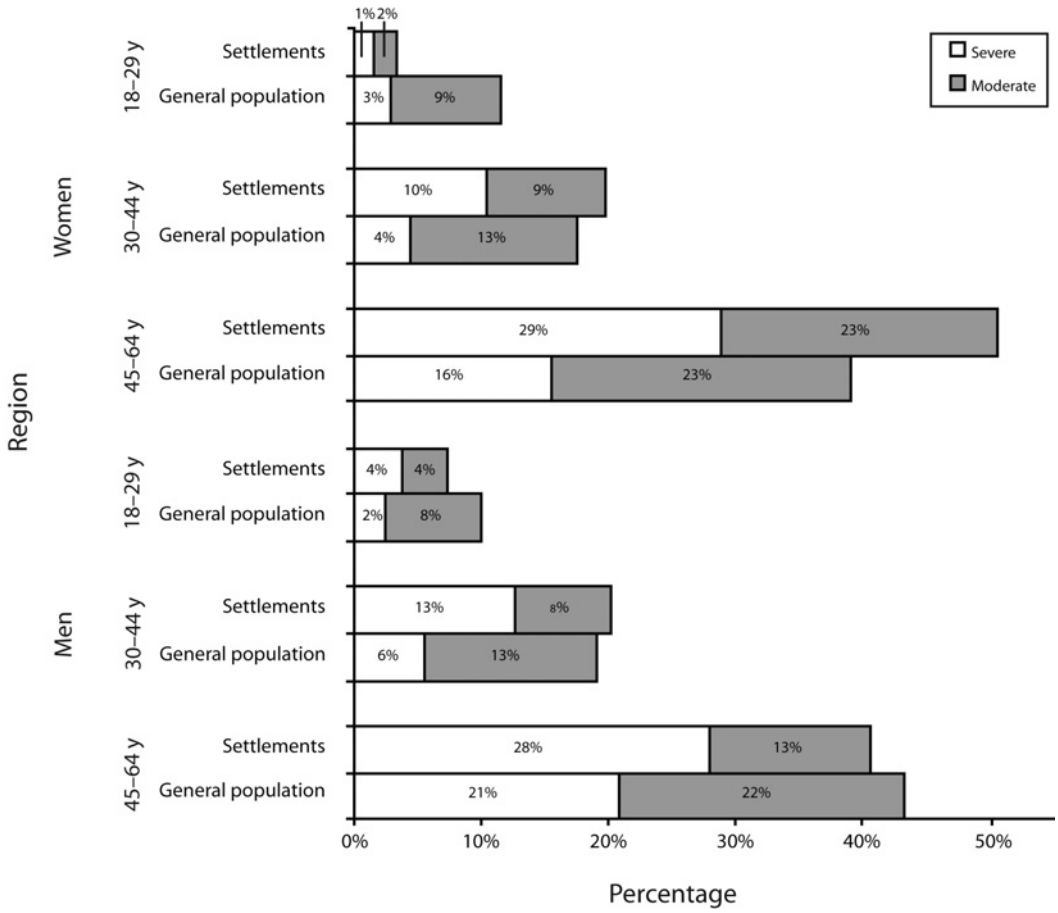
Similarly, at age 30 years and beyond, the prevalence of functional limitation was higher among women living in settlements than in the general population because of the very high frequency of severe functional limitation (Figure 1). The result was similar in the lowest income quartile of the general population. Among men, practically no difference between the Roma and the general population was seen in the prevalence of any limitation; however, the prevalence of severe functional limitation in men aged 30 years or older was highest among the Roma people and among those in the general population with the lowest income.

Roma persons were less likely to use health services than was the general population (Table 2). The difference was especially marked in the proportion of persons who consulted a specialist and in the proportion of those who had dental service in the previous 12 months. No significant difference was found in the proportion of persons who had a hospital stay in the previous 12 months. Despite the existence of a universal screening program in Hungary, only 25% of the Roma women aged 45 to 64 years had undergone mammography within the previous 2 years. Use of health services by the Roma population was similar to use by those in the lowest income quartile of the general population.

Some kind of discrimination related to health service use was reported by 35% (95% CI=33%, 37%) of the Roma persons and 4.4% (95% CI=3.7%, 5.1%) of the general population. The corresponding figure was 6.7% (95% CI=5.0%, 9.0%) in the lowest income quartile of the general population. Of the Roma persons who reported discrimination, 69% (95% CI=62%, 75%) attributed it to their ethnicity or skin color and 18% (95% CI=13%, 24%) attributed it to their social status. The corresponding figures were 6.0% (95% CI=3.3%, 11%) and 5.0% (95% CI=0.7%, 9.1%) in the general population.

A large difference was seen between the Roma population and the general population in the proportion of subjects who thought that they could do much or very much to promote their own health. In the general population, the proportions were 88% (95% CI=86%, 90%), 80% (95% CI=77%, 82%), and 66% (95% CI=64%, 69%) in the age groups of 18 to 29, 30 to 44, and 45 to 64 years, respectively, whereas the corresponding figures were 68% (95% CI=64%, 73%), 53% (95% CI=48%, 59%), and 39% (95% CI=33%, 46%) in the Roma population and 73% (95% CI=66%, 79%), 66% (95% CI=60%, 72%), and 53% (95% CI=48%, 58%) in the lowest income quartile of the general population.

Table 3 shows that the prevalence of smoking more than 20 cigarettes per day was 2 to 5 times higher among the Roma population than in the general population. The prevalence of smoking was considerably higher among the Roma people older than 30 years than in the lowest income quartile of the general population. Roma persons were younger than the general population when they started smoking, with a mean age at initiation of 16.1



Note. Functional limitation was assessed by the following question: "Do you have any complaints, injuries, or diseases that limit your everyday activities, such as working, shopping, managing your life, playing sports, or keeping contact with other people?" Numbers are estimated proportions (%) in the populations.

FIGURE 1—Prevalence of functional limitation in men and women in the Roma settlements and the general population: National Health Interview Survey 2003 and Roma Health Survey 2004

years (95% CI=15.8, 16.3), whereas the corresponding figure was 18.3 years (95% CI=18.1, 18.6) in the general population.

No large differences were detected in the overall prevalence of moderate and heavy drinking between Roma people and the general population, although the pattern varied by age, with a somewhat higher prevalence of heavy drinking among the Roma men aged 18 to 29 years and a lower prevalence among these men at age 30 years and older (Table 3). Roma men in all age groups had a higher prevalence of abstinence (Table 3) than did all of the general population.

The distribution of body weight was broadly similar in the 2 populations, except that obesity tended to be slightly less frequent in Roma women in all age groups. A stark contrast was noted between the Roma population and the general population in their diet. The proportion of persons who generally used vegetable oil to cook with and ate fresh fruits and vegetables daily was much higher in the general population, even compared with those in the lowest income quartile (Table 3).

DISCUSSION

Any attempt to assess the health of the Roma people in Central Europe faces the fundamental problem noted in the introduction of how to define the population. Yet this difficulty must not be used as an excuse to avoid the attempt to quantify the burden of ill health that they face.

The problem of ill health among the Roma populations has become especially pressing because of the priority now being given to improving the situation of the Roma population in this region, exemplified by the attention given to this issue in the negotiations leading up to Hungary's European Union accession; the establishment of the Decade of Roma Inclusion, an initiative involving the World Bank, European Union, and Open Society Institute along with many Roma nongovernmental organizations; and related initiatives by organizations such as the United Nations Development Programme. Specific programs aiming to improve the health of Roma people exist in Hungary. The latest governmental decree on integrating the Roma of Hungary prescribed

TABLE 2—Health Service Use in the Previous 12 Months Among Persons Living in Roma Settlements and in the General Population in Hungary: National Health Interview Survey 2003 and Roma Health Survey 2004

	People Living in Roma Settlements			General Population		
Health Service Use	18–29 y Estimated Proportion, % (95% CI)	30–44 y Estimated Proportion, % (95% CI)	45–64 y Estimated Proportion, % (95% CI)	18–29 y Estimated Proportion, % (95% CI)	30–44 y Estimated Proportion, % (95% CI)	45–64 y Estimated Proportion, % (95% CI)
Women						
Use of any services	65 (58, 71)	62 (55, 70)	78 (69, 85)	74 (70, 77)	73 (69, 76)	80 (78, 83)
Contact with family physician	70 (64, 76)	71 (63, 77)	86 (78, 91)	62 (59, 65)	62 (59, 65)	77 (75, 79)
Consulting a specialist	51 (44, 58)[a]	42 (35, 50)[a]	58 (49, 67)	68 (64, 72)[a]	68 (64, 71)[a]	69 (66, 72)
Dental service	44 (38, 51)[a]	33 (26, 41)[a]	32 (24, 41)	61 (57, 65)[a]	50 (46, 54)[a]	39 (36, 43)
Inpatient service[b]	11 (8, 16)	14 (9, 20)	17 (11, 25)	16 (14, 20)	13 (11, 16)	18 (15, 20)
Gynecologist appointment in the previous 5 y	90 (85, 93)	82 (75, 87)[a]	62 (53, 71)[a]	90 (87, 92)	92 (89, 94)[a]	86 (84, 87)[a]
Mammography in the previous 2 y	8 (5, 13)	15 (10, 21)	25 (18, 34)	9 (6, 11)	24 (20, 27)	70 (67, 74)[a]
Men						
Use of any services	42 (35, 49)[a]	48 (40, 56)[a]	67 (57, 75)	60 (56, 64)[a]	61 (57, 65)[a]	72 (68, 75)
Contact with family physician	48 (41, 55)[a]	51 (43, 59)[a]	74 (65, 81)	67 (63, 71)[a]	68 (64, 71)[a]	73 (71, 75)
Consulting a specialist	22 (16, 28)[a]	23 (17, 31)	42 (34, 52)	38 (33, 42)[a]	35 (31, 38)	51 (47, 54)
Dental service	38 (31, 45)	26 (20, 34)[a]	21 (14, 29)	42 (37, 46)	40 (36, 44)[a]	30 (27, 34)
Inpatient service[a]	3 (1, 7)	10% (6, 16)	23 (16, 31)	6 (4, 8)	8 (6, 10)	17 (15, 20)

Note. CI = confidence interval.
[a]The 95% CIs of the estimates in the Roma population and in the general population do not overlap.
[b]Spent at least 1 night in a hospital.

several tasks to be implemented for improving the quality of life of Roma people, such as eliminating or remodeling settlements. In the framework of Hungary's National Public Health Programme, funding has been dedicated to research into the health and social problems of the Roma population as well as to various training activities to improve the attitude of health and social care workers toward this minority. Furthermore, many nongovernmental organizations work with Roma communities in Hungary, most of them focusing on health education.

Although previous surveys of the health and living conditions of the Roma population have been done—most notably, a series undertaken by the United Nations Development Programme[24]—ours is the first study designed explicitly to compare the health of the Roma population with that of their majority neighbors. The United Nations Development Programme survey examined living conditions, beliefs, and attitudes but few that were directly related to health.

The current survey of Roma people had 1 obvious limitation: it was not representative of the overall Hungarian Roma population. By design, it excluded those Roma who have, to various degrees, assimilated with the majority population. However, because many people are unwilling to self-define their ethnicity as Roma, this constraint will be very difficult to overcome. An inevitable consequence was that the Roma Health Survey captured the characteristics of the most disadvantaged section of the Roma population. However, the needs of this group are the most important to understand from a policy perspective.

It is also important to note that the National Health Interview Survey will have included some people who are Roma. However, the difficulty with self-defined ethnicity is that it is not possible to exclude them from the sample for the purposes of analysis. It is, however, possible that their inclusion will dilute the true difference between the populations.

A further limitation was that because the age distribution of the Roma population was younger than in the National Health Interview Survey, it would have been desirable to have stratified the sample with narrow age categories to avoid confounding by age. However, the relatively small number of persons involved in the Roma Health Survey precluded doing so, and it is very unlikely that residual confounding by age within the age categories used could have affected our results substantially. In addition, although persons older than 64 were included in the surveys, the very low numbers in the Roma Health Survey precluded their inclusion in the analysis. Finally, as in any survey based on self-report, the data on alcohol consumption must be interpreted with caution.

The study of those living in the Roma settlements did, however, have some important strengths. The high response rate—facilitated by the employment of Roma fieldworkers and the participation of community leaders at all stages in the survey—coupled with the sampling method used suggest that the findings are likely to be representative of those living in such settlements. The use of identical questionnaires in both surveys ensured comparability; pretesting did not give any cause to believe that questions would be interpreted differently by the 2 populations.

Our comparison determined that people living in the Roma settlements have much poorer health than does the general population. At ages 45 to 64, their self-reported health status was even worse than in the lowest income quartile of the general population. The lifestyles of the people living in Roma settlements are also less conducive to future health, as measured by rates of smoking and the low consumption of fruits and vegetables, even when compared with the lowest income quartile of the general population. In addition to their high burden of ill health, they face barriers in accessing health services, particularly preventive interventions and specialist care. This finding is consistent with extensive evidence of such barriers to care reported in qualitative studies, in part reflecting poorer access because Roma settlements are often underserved by essential services and, where they exist, are often difficult to staff. However, a further important factor is the high frequency with which Roma respondents described experiencing direct discrimination

TABLE 3—Prevalence of Health Determinants Among Persons Living in Roma Settlements and in the General Population in Hungary: National Health Interview Survey 2003 and Roma Health Survey 2004

	People Living in Roma Settlements			People in Lowest Income Quartile			General Population		
Health Determinants	18–29 y Estimated Proportion, % (95% CI)	30–44 y Estimated Proportion, % (95% CI)	45–64 y Estimated Proportion, % (95% CI)	18–29 y Estimated Proportion, % (95% CI)	30–44 y Estimated Proportion, % (95% CI)	45–64 y Estimated Proportion, % (95% CI)	18–29 y Estimated Proportion, % (95% CI)	30–44 y Estimated Proportion, % (95% CI)	45–64 y Estimated Proportion, % (95% CI)
Women									
Cigarette smoking									
Never	40 (34, 47)	22 (17, 29)	32 (24, 41)[a]	43 (34, 52)	36 (28, 45)	55 (48, 61)[a]	53 (49, 57)	47 (42, 51)	56 (53, 59)
Former	9 (6, 14)	12 (8, 18)	13 (8, 20)	7 (3, 13)	8 (5, 14)	13 (9, 19)	12 (9, 15)	12 (9, 14)	16 (14, 19)
Moderate[b]	26 (20, 32)	17 (12, 23)	12 (7, 19)	26 (19, 34)	31 (24, 40)	19 (14, 24)	24 (21, 27)	24 (21, 28)	19 (17, 22)
Heavy[c]	25 (20, 32)	49 (42, 57)[a]	44 (35, 54)[a]	25 (18, 32)	25 (18, 32)[a]	14 (10, 19)[a]	12 (10, 15)	18 (15, 21)	9 (7, 10)
Alcohol consumption									
Abstinent	83 (77, 88)	82 (76, 88)[a]	91 (84, 95)[a]	81 (73, 88)	66 (58, 74)[a]	71 (65, 77)[a]	57 (53, 61)	55 (51, 59)	61 (57, 65)
Occasional	14 (10, 20)	13 (8, 19)[a]	7 (4, 14)	17 (11, 26)	28 (21, 36)[a]	19 (14, 25)	36 (32, 40)	35 (31, 39)	26 (23, 29)
Moderate	2 (1, 5)	3 (1, 7)	1 (0, 6)	2 (0, 6)	4 (2, 9)	6 (4, 11)	4 (3, 7)	8 (6, 10)	11 (9, 13)
Heavy	1 (0, 4)	2 (1, 6)	1 (0, 6)	0	1 (0, 5)	3 (2, 7)	3 (2, 5)	2 (1, 4)	2 (2, 4)
Body mass index[d]									
Abnormally thin	10 (7, 15)	8 (5, 14)	4 (2, 10)	12 (7, 20)	5 (2, 10)	3 (1, 6)	13 (10, 16)	4 (3, 6)	3 (2, 4)
Normal	71 (65, 77)	52 (44, 60)	41 (32, 51)	64 (55, 72)	49 (41, 57)	33 (27, 39)	68 (64, 71)	57 (53, 61)	35 (32, 38)
Overweight	14 (10, 20)	28 (22, 36)	34 (26, 44)	16 (11, 24)	25 (18, 33)	37 (31, 44)	14 (12, 17)	25 (22, 29)	38 (35, 41)
Obese	4 (2, 8)	11 (7, 17)[a]	21 (15, 30)	8 (4, 14)	21 (15, 29)[a]	27 (22, 34)	5 (4, 8)	14 (12, 17)	25 (22, 28)
Diet									
Use of vegetable oil	26 (21, 33)[a]	30 (23, 37)[a]	28 (21, 37)[a]	54 (44, 63)[a]	48 (39, 56)[a]	48 (41, 54)[a]	70 (66, 73)	63 (59, 67)	61 (57, 64)
Consumption of fruits and vegetables daily	32 (26, 39)	36 (29, 44)[a]	36 (27, 45)[a]	45 (37, 53)	55 (46, 63)[a]	69 (62, 75)[a]	55 (50, 59)	66 (63, 70)	77 (74, 79)
Consumption of fruits and vegetables weekly	49 (43, 56)	45 (38, 53)	42 (33, 51)[a]	43 (35, 52)	37 (29, 45)	21 (16, 27)[a]	40 (36, 44)	29 (26, 33)	18 (16, 21)
Consumption of fruits and vegetables < weekly	18 (14, 24)	19 (13, 25)	23 (16, 32)[a]	13 (8, 20)	9 (5, 15)	11 (7, 15)[a]	5 (3, 7)	5 (3, 7)	5 (4, 7)
Men									
Cigarette smoking									
Never	31 (25, 38)	20 (15, 28)	13 (8, 20)	17 (10, 27)	27 (21, 35)	22 (17, 29)	41 (37, 44)	38 (34, 42)	29 (26, 32)
Former	5 (3, 9)	6 (3, 11)	17 (11, 25)	6 (2, 14)	11 (7, 18)	28 (21, 35)	8 (6, 11)	17 (14, 20)	32 (28, 35)
Moderate[b]	14 (10, 19)[a]	13 (8, 19)	17 (11, 25)	36 (25, 48)[a]	14 (9, 21)	19 (14, 26)	28 (25, 32)	15 (12, 19)	15 (13, 18)
Heavy[c]	50 (43, 57)	62 (53, 69)	53 (44, 62)[a]	42 (31, 53)	48 (39, 57)	32 (25, 39)[a]	23 (20, 27)	30 (26, 35)	24 (22, 28)
Alcohol consumption[e]									
Abstinent	44 (37, 51)	45 (37, 53)	59 (50, 68)[a]	40 (29, 52)	29 (21, 38)	30 (23, 37)[a]	30 (26, 33)	25 (21, 29)	23 (20, 27)
Occasional	16 (11, 22)[a]	14 (9, 21)	12 (7, 20)	33 (24, 45)[a]	27 (19, 35)	19 (13, 26)	36 (32, 40)	26 (22, 30)	17 (14, 20)
Moderate	24 (19, 31)	26 (19, 33)	16 (10, 24)	15 (8, 26)	22 (15, 31)	30 (24, 37)	23 (20, 26)	31 (27, 35)	39 (35, 42)
Heavy	16 (12, 22)	16 (11, 23)	13 (8, 21)	12 (6, 22)	23 (16, 31)	22 (17, 29)	12 (9, 15)	18 (15, 22)	21 (18, 25)
Body mass index									
Abnormally thin	1 (0, 4)	3 (1, 8)	1 (0, 7)	0	1 (0, 5)	2 (1, 4)	2 (1, 4)	0.4 (0.1, 1.4)	1 (0.8, 2)
Normal	58 (51, 65)	39 (31, 47)	41 (32, 51)	60 (49, 71)	40 (33, 49)	48 (43, 53)	62 (58, 66)	38 (34, 42)	31 (28, 35)
Overweight	37 (30, 44)	40 (32, 48)	36 (28, 46)	28 (18, 39)	39 (31, 47)	34 (29, 39)	26 (23, 30)	43 (39, 48)	44 (40, 48)
Obese	5 (3, 9)	18 (13, 26)	22 (15, 31)	12 (6, 24)	21 (14, 29)	17 (13, 21)	10 (8, 13)	19 (15, 23)	24 (21, 27)
Diet									
Use of vegetable oil	21 (16, 27)[a]	28 (21, 36)	22 (16, 31)[a]	50 (38, 62)[a]	41 (33, 50)	37 (30, 44)[a]	61 (56, 66)	62 (58, 66)	59 (56, 61)
Consumption of fruits and vegetables daily	28 (22, 35)	31 (24, 39)	37 (28, 46)	40 (29, 53)	44 (36, 53)	53 (45, 61)	42 (38, 46)	49 (45, 54)	60 (56, 63)
Consumption of fruits and vegetables weekly	44 (38, 51)	45 (37, 53)	31 (23, 40)	49 (37, 61)	41 (33, 50)	31 (25, 39)	50 (46, 54)	42 (38, 46)	34 (30, 37)
Consumption of fruits and vegetables < weekly	27 (22, 34)[a]	24 (18, 32)	32 (24, 41)[a]	10 (5, 20)[a]	15 (9, 22)	16 (11, 22)[a]	8 (6, 11)	9 (6, 12)	7 (5, 9)

Note. CI = confidence interval.

[a]The 95% CIs of the estimates in the Roma population and in the lowest equivalent income quartile of the general population do not overlap.

[b]Occasional or daily but fewer than 20 cigarettes per day.

[c]At least 20 cigarettes per day.

[d]BMI was calculated as body weight (kg) divided by height in meters squared (m^2). BMI was categorized as abnormally thin (BMI < 18.5 kg/m^2), normal (BMI = 18.5–24.99 kg/m^2), overweight (BMI = 25–29.99 kg/m^2), or obese (BMI ≥ 30 kg/m^2).

[e]Alcohol consumption was categorized as heavy drinking (more than 7 standard drinks—a standard drink was defined as the equivalent of 12 g of pure ethanol—per week or more than 3 standard drinks on any day for women; more than 14 standard drinks per week or more than 5 standard drinks on any day for men), moderate drinking (weekly consumption but less than heavy drinking), occasional drinking (consumption less often than weekly), and abstinence.

when seeking care, again consistent with many qualitative studies and accounts in the media.

Although this analysis has provided a basic description of how the health of the population living in Roma settlements in Hungary differs from that of the majority population, it is of course only a first step in understanding the substantial inequality in health between the Roma and the majority population. Further analyses are beyond the scope of this initial article, but the simple comparison of health, health behavior, and health service use of Roma people with that of persons in comparable socioeconomic conditions in the general population identified specific Roma disadvantages in health behavior and ethnic discrimination.

It is also relevant to report on some findings of the environmental survey that served as a basis for identifying the Roma settlements. These settlements were often characterized by illegal garbage deposits and an absence of drainage, gas mains, and paved roads. Some settlements had no electricity or water mains. Many settlements are built on ground that becomes waterlogged after rainfall. These settlements pose substantial health hazards to their inhabitants.[16]

In summary, our study provided strong quantitative evidence of the poor health of a section of the Roma people and highlighted the need to develop appropriate multisectoral interventions that will help them to achieve their full health potential. In addition to tackling the socioeconomic roots of poor health of the Roma people, specific public health interventions, including health education and health promotion programs, are needed. The training of community health workers of Roma origin—as recommended in the National Public Health Programme—should continue. Involvement of these health workers in public health service can increase the efficiency of public health programs in Roma communities. ■

About the Authors

Zsigmond Kósa is the county chief medical officer of Szabolcs-Szatmár-Bereg County, Hungary. György Széles, László Kardos, Karolina Kósa, Gabriella Fésüs, Róza Ádány, and Zoltán Vokó are with the School of Public Health, Medical and Health Science Centre, University of Debrecen, Hungary. Renáta Németh and Sándor Országh are with the Johan Béla National Center for Epidemiology, Budapest, Hungary. Martin McKee is with the London School of Hygiene and Tropical Medicine, London, England.

Requests for reprints should be sent to Zoltán Vokó, MD, PhD, Department of Preventive Medicine, Faculty of Public Health, Medical and Health Science Centre, University of Debrecen, H-4028 Debrecen, Kassai út 26/b, Hungary (e-mail: z.voko@sph.dote.hu).

This article was accepted October 14, 2005.

Contributors

Z. Kósa and R. Ádány had the original idea for the comparative Roma Health Survey. Z. Kósa participated in the questionnaire and sampling design and wrote the article. G. Széles was involved in the questionnaire development, designed and performed the sampling, and interpreted the results. L. Kardos performed the analysis. K. Kósa was responsible for the environmental health survey of the settlements that served as a basis for the Roma Health Survey and wrote the article. R. Németh was involved in the questionnaire development, designed and performed the sampling, and performed the analysis. S. Országh was involved in the questionnaire development, managed the data, and did the programming. G. Fésüs interpreted the results. M. McKee interpreted the results and wrote the article. R. Ádány designed and performed the sampling and interpreted the results. Z. Vokó was involved in the questionnaire development, interpreted the results, and wrote the article.

Acknowledgments

The National Health Interview Survey, 2003, was funded by the Hungarian Ministry of Health in the framework of the National Public Health Programme. The Roma Health Survey was funded from Hungarian research grants from the National Research and Development Program (NKFP-1B/0013/2002), the National Scientific Council on Health (ETT: 445/2003), and the Ministry of Environment (KvH-96/167/2000).

The contribution of fieldworkers and other study personnel is gratefully acknowledged, as is the support of the Ministry of Health, Ministry of Environment, and Ministry of Education of Hungary.

Human Participant Protection

The National Health Interview Survey, 2003, and the Roma Health Survey on which this study was based were approved by the Ethical Committee of the Hungarian National Scientific Council on Health. Participants gave written informed consent in both surveys.

References

1. European Commission, Directorate General for Employment and Social Affairs. *The Situation of Roma in an Enlarged European Union.* Brussels, Belgium: Commission of the European Communities; 2004.
2. Ringold D, Orenstein MA, Wilkens E. *Roma in an Expanding Europe: Breaking the Poverty Cycle.* Washington, DC: World Bank; 2003. Available at: http://siteresources.worldbank.org/EXTROMA/Resources/roma_in_expanding_europe.pdf. Accessed October 18, 2005.
3. McKee M, Adany R, MacLehose L. Health status and trends in candidate countries. In: McKee M, MacLehose L, Nolte E, eds. *Health Policy and European Union Enlargement.* Maidenhead, England: Open University Press; 2004:24–42. European Observatory on Health Systems and Policies Series.
4. Sutherland A. *Gypsies: The Hidden Americans.* London, England: Macmillan; 1975.
5. Hancock I. *The Pariah Syndrome: An Account of Gypsy Slavery and Persecution.* Ann Arbor, Mich: Karoma; 1975.
6. Zoon I. *On the Margins: Roma and Public Services in Romania, Bulgaria, and Macedonia.* New York, NY: Open Society Institute; 2001.
7. Koupilová I, Epstein H, Holcík J, Hajioff S, McKee M. Health needs of the Roma population in the Czech and Slovak Republics. *Soc Sci Med.* 2001;53:1191–1204.
8. Kósa K, Lénárt B, Ádány R. Health status of the Roma population in Hungary [in Hungarian]. *Orv Hetil.* 2002;143:2419–2426.
9. Hajioff S, McKee M. The health of the Roma people: a review of the published literature. *J Epidemiol Community Health.* 2000;54:864–869.
10. Crowe DM. *A History of the Gypsies of Eastern Europe and Russia.* London, England: I.B. Tauris Publishers; 1995.
11. Fonseca I. *Bury Me Standing—The Gypsies and Their Journey.* New York, NY: Vintage; 1996.
12. Ladányi J, Szelényi I. Who is gypsy? [in Hungarian] *Kritika.* 1997;(Dec):3–6.
13. Ladányi J, Szelényi I. On the objectivity of ethnic classification [in Hungarian]. *Kritika.* 1998;(March):33–35.
14. Krizsán A, ed. *Ethnic Monitoring and Data Protection: The European Context.* Budapest, Hungary: INDOK (Human Rights Information and Documentation Center); 2001.
15. *National Health Interview Survey 2003, Hungary—Executive Update.* Budapest, Hungary: Johan Béla National Center for Epidemiology; 2004. Available at: http://www.oek.hu/oekfile.pl?fid=533. Accessed February 8, 2007.
16. *Environmental Health Hazards of Ethnic Minorities Living in Colonies* [in Hungarian]. Debrecen, Hungary: School of Public Health, University of Debrecen; 2001. Project Report (KKF/1645/2000) to the Ministry of Environment of the Republic of Hungary.
17. Kemény I, Janky B, Lengyel G. *Roma in Hungary, 1971–2003* [in Hungarian]. Budapest, Hungary: Gondolat Kiadó-MTA Etnikai-nemzeti Kisebbségkutató Intézet; 2004.
18. Milligan P, Njie A, Bennett S. Comparison of two cluster sampling methods for health surveys in developing countries. *Int J Epidemiol.* 2004;33:469–476.
19. *Questionnaire of the National Health Interview Survey 2003.* Budapest, Hungary: Johan Béla National Center for Epidemiology; 2004. Available at the European Health Interview & Health Examination Surveys Database: https://www.iph.fgov.be/hishes/print.cfm. Accessed October 18, 2005.
20. Bruin A, Picavet HSJ, Nossikov A. *Health Interview Surveys Towards International Harmonization of Methods and Instruments.* Copenhagen, Denmark: World Health Organization Regional Office for Europe; 1996.
21. *Are Women More Vulnerable on Alcohol Effects?* Rockville, Md: National Institute on Alcohol Abuse and Alcoholism; 1999;46. Alcohol Alert.
22. Vik PW, Culbertson KA, Sellers K. Readiness to change drinking among heavy drinking college students. *J Stud Alcohol.* 2000;61:674–680.
23. Cox BD, Blaxter M, Buckle ALJ, et al. The Health and Lifestyle Survey. London, England: The Health Promotion Research Trust; 1987.
24. *Avoiding the Dependency Trap.* New York, NY: United Nations Development Programme; 2002.